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A New Softshell Turtle (Genus *Trionyx*) from Coahuila, Mexico

BY

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For ten days in September, 1958, a field party from the University of Kansas Museum of Natural History (KU) collected aquatic vertebrates in central Coahuila, Mexico. Among the specimens are 14 examples of *Trionyx* obtained in the basin of Cuatro Ciénegas. Examination of these turtles revealed the presence of two distinct species. Five of the specimens are *Trionyx spinifer emoryi*. The remaining nine specimens and one other individual, in the University of Illinois Museum of Natural History (IU), represent a previously unrecognized species that, in allusion to its over-all blackish coloration, may be known as:

*Trionyx uter** sp. nov.

Black Softshell

?*Amyda mutica*, Müller, Verh. Naturf. Ges. Basel, vol. 6, 1878, p. 641.

Holotype.—KU 46903, alcoholic; female; obtained 16 kilometers south of Cuatro Ciénegas, Coahuila, September 6, 1958, by John M. Legler, Wendell L. Minckley, and Robert B. Wimmer; original number, JML 1708 (Pl. I).

Paratypes.—A total of nine alcoholic specimens: KU 46904-6, 46908-10, 46912 (females), KU 46911 (male); same data as holotype; obtained September 6 to 8, 1958; IU 43510 (female), obtained 5.7 miles west of Cuatro Ciénegas, Coahuila, July 10, 1958, by Pete S. Chrapliwy and Kenneth L. Williams.

Diagnosis.—A species of softshell turtle most closely allied to *Trionyx spinifer emoryi* and having: (1) uniform blackish coloration.

* *ater* (Latin) = black.

tion (rather than a pattern of pale and dark markings) on the carapace and dorsal surfaces of limbs, neck, and head; (2) ventral surfaces heavily speckled with black; (3) no evidence of a pale marginal band on carapace (females only); (4) longitudinal corrugations on the posterior part of the carapace (most females); (5) no ridges projecting into the nostrils (septal ridges) from the nasal septum in males; (6) small white tubercles on posterior half of carapace (males only); and (7) an ovoid carapace (adult and nearly adult specimens).

Description of holotype.—Carapace ovoid, margin smooth laterally, rugose posteriorly; dorsal surface of carapace smooth except for posterior part; anterior margin of carapace having obtuse prominences but lacking tubercles; posterior fleshy part of carapace having numerous minute longitudinal corrugations; width of carapace contained in length, 1.4 times; height contained in width, 2.8 times. Posterior lobe of plastron rounded and truncate; width of bony bridge, 32 millimeters. Head terminating in elongate fleshy snout; nostrils rounded, each with a ridge (septal ridge) projecting laterally from nasal septum; horny parts of jaws concealed by fleshy lips except anteriorly; internal nares each partly covered by elongate flap of oral integument projecting from lateral border, each flap bearing fleshy denticulations on medial edge; least distance between orbits, 4 millimeters. Forefeet and hind feet fully webbed, having five digits each; first three digits of each foot bearing claws; four cornified areas (three of which are falciform and have a free edge) on antebrachium; each hind limb having smooth cornified area on posterodorsal surface and another (with free edge) on posteroventral surface. Tip of tail flexible, blunt, projecting beyond posterior edge of carapace; skin of tail rugous, less so ventrally than dorsally; anterior tip of cloaca to tip of tail, 20 millimeters; posterior edge of carapace to tip of tail, 24 millimeters (see table 1 for other measurements of holotype and paratypes).

Dorsal surface of carapace blackish in general aspect (dense mottling of blackish brown and gray evident when specimen is immersed in preservative), lacking pale marginal band; plastron and undersurfaces of carapace whitish, having numerous small blackish marks; blackish marks more numerous in area of bridge than on other ventral surfaces; hyoplastra, hypoplastra, and xiphyplastra (plastral callosities) bluish gray where visible beneath translucent skin of plastron; snout and side of head bluish gray; head and neck blackish above, bluish white with fine scattered darker markings below; no pattern on snout or side of head; limbs slate with paler

areas of bluish gray above, whitish and tinged with red below; ventral surfaces of hind feet speckled with black; inguinal area whitish, tinged with red, lacking darker markings; tail slate above, whitish and tinged with red below.

Variation.—The paratypic series consists of one adult male (mature, as indicated by elongate preanal region with cloaca extending beyond posterior edge of carapace, and fully developed penis) and eight subadult females.

The male (Pl. II) is unique in lacking septal ridges. The carapace is dark gray and has small white tubercles posteriorly. The anterior edge of the carapace is smooth. The posterior edge of the carapace has an obscure pale narrow band, and lacks the corrugations seen in females. The over-all dorsal coloration is blackish. The ventral surface is whitish with a few black marks on the underside of the posterior flap of the carapace. The ventral surfaces of the tail and hind limbs are tinged with red.

The seven females resemble the holotype in over-all blackish dorsal coloration, obtuse prominences on the anterior edge of the carapace, and lack of a pale band on the posterior edge of the carapace. Shape of carapace varies from ovoid (KU 46908) to nearly circular (KU 46909). Four of the specimens (KU 46904, 46908, 46910, and 46912) differ from the holotype in lacking longitudinal corrugations on the posterior part of the carapace. On the smallest female (KU 46904) a dark line extends anteriorly from each eye and a dark line connects the anterior margins of the orbits. Black pigment on the ventral surfaces is reduced in three specimens (KU 46904, 46910, and 46912). The ventral surface of the tail is especially reddish in two specimens (KU 46910 and 46912).

Flaps of skin extending from the lateral borders of the internal nares partly cover the nares of all KU paratypes as well as the holotype. Flaps occur also in the specimens of *T. spinifer emoryi* examined by us (as well as in other forms of *Trionyx* examined by Webb); the flaps in *emoryi* differ from those of *ater* chiefly in being folded vertically against the lateral borders of the nares (not extending horizontally into and partly covering the nares). Possibly the flaps are movable; as yet, we are unable to evaluate the functional and taxonomic significance of these flaps.

One female paratype (IU 43510) more closely resembles *T. spinifer emoryi* than do other specimens of *T. ater*. Pertinent features of the paratype are as follows: (1) more prominent mottling of carapace and other dorsal surfaces; (2) posterior rim of carapace having obscure, pale, narrow band; (3) snout having obscure,

emoryi-like pattern of dark lines; (4) plastron less extensively blackish; and (5) internal narial flaps vertical, not projecting into internal narial openings. Possibly the specimen is a hybrid.

Range.—Known only from the type locality and other ponds in the basin of Cuatro Ciénegas, central Coahuila, Mexico. Müller (1878:641) listed *Amyda mutica* from "Mexico" but did not mention a specific locality. Presumably Müller referred to a male of *T. ater* (*T. muticus* is not known to occur in Mexico). The present report brings to two (*T. ater* and *T. spinifer emoryi*) the number of kinds of softshell turtles known to occur in Mexico.

Relationships.—*Trionyx ater* can be distinguished from all other American forms of the genus by the following combination of characters: (1) an over-all blackish, dorsal coloration; (2) lack of all but a trace of a pale marginal rim on the carapace; (3) the lack of septal ridges in males; and (4) the presence of longitudinal corrugations on the posterior part of the carapace. We consider the closest living relative of *T. ater* to be *T. spinifer emoryi*. Both forms resemble *T. muticus* by virtue of reduction in size (*emoryi*) or complete loss (males of *ater*) of tubercles on the anterior edge of the carapace. Loss of the septal ridge in males of *T. ater* tends also to ally this species with *T. muticus* (septal ridges lacking in both sexes).

Trionyx ater is closely related also to *T. ferox* of Florida. Both species have an over-all slate or blackish dorsal coloration, lack a well-defined pattern on the limbs, and have at most a narrow or obscure pale marginal band on the carapace. In both species the carapace is ovoid and never has tubercles that are sharp-pointed or conical on its anterior edge. *T. ater* differs from *T. ferox* in having longitudinal corrugations on the posterior part of the carapace and no septal ridges in males. The corrugations suggest but differ from the longitudinal rows of tubercles in *ferox*. Both species have relatively restricted, southerly displaced, geographic ranges.

It is of interest that the male of *T. ater*, having a smooth anterior edge of the carapace, and no ridge projecting from the nasal septum, resembles *T. muticus* more closely than do the females of *T. ater*. Females of *T. ater* have a suggestion of tubercles along the anterior edge of the carapace, no pale marginal rim on the carapace, and corrugations on the periphery at the posterior end of the carapace, thus resembling *T. ferox* more closely than does the male.

Trionyx ater seems to be a relict population of pre-*spinifer* stock. Although the resemblance and relationship of *T. ater* and *T. s.*

emoryi is close, we consider *ater* a full species because of its geographical sympatry with *T. s. emoryi* and the apparent lack of populations intermediate between the two forms.

The sympatry of *T. s. emoryi* and *T. ater* is accompanied by partial ecological separation. Habitat preferences of the two species of *Trionyx* in the basin of Cuatro Ciénegas were evident in that only one specimen (KU 46907, adult male, Pl. II) of *T. spinifer emoryi* was obtained in the non-fluviatile water of the type locality of *T. ater*, whereas specimens of both sexes of *emoryi* [KU 46913-16 (and two specimens that escaped) Pl. I] but no specimens of *T. ater* were obtained in the Río Chiquito, 10 kilometers south of Cuatro Ciénegas. At the latter locality the river is 30 to 50 feet wide and has a swift current; vegetation of the quiet backwaters is much like that of the type locality of *T. ater* however (see discussion of habits and habitat). Much the same habitat relationship exists between *T. ferox* and *T. s. asper* in areas where the ranges of the two species overlap. Crenshaw and Hopkins (1956:16) stated, regarding the area of overlap of these two forms, ". . . *asper* is nearly always an inhabitant of fluviatile situations whereas *ferox* is equally closely confined to non-fluviatile lakes and ponds."

Studies of other species of aquatic vertebrates from the basin of Cuatro Ciénegas indicate that the pond habitats in the basin were isolated in the past and that because of this isolation speciation of vertebrates took place to varying degrees. The present external drainage of the area has permitted overlap and subsequent interbreeding of some of the previously isolated forms with those from the Río Salado and Río Grande drainages, whereas certain other species, through ecological specialization have been able to remain distinct. *T. ater* seems to be in the latter category. The fact that ecological separation of *T. ater* and *T. s. emoryi* is not complete indicates that interspecific matings, possibly resulting in hybrids, might occur. Matings of *T. spinifer* with *T. muticus* have been reported (Legler, 1955).

One of us (Webb) is currently undertaking a taxonomic study of American forms of *Trionyx*.

Habitat and habits.—Cuatro Ciénegas is situated in an intermontane basin, the floor of which has an elevation of approximately 2400 feet. The basin is approximately 30 miles long (from west to east) and five to 15 miles wide. The Río Chiquito (called "Río Colorado" by some natives), originates in the southwestern part, receives several intermittent tributaries within the basin, and flows out through a gap in the eastern end. The Río Chiquito flows

thence northeastward and joins the Río Salado near Hermanas, ultimately draining into the lower Río Grande near Zapata, Texas.

Much of the central part of the basin is marshy. The sandy slopes that lead up to the rocky sides of the valley are dry. A number of clear, deep ponds of various sizes, chiefly west and south of the town—as well as a hot spring approximately nine kilometers south of town—occur in the marshy areas. The ponds were previously isolated but are now drained (and interconnected) by small, man-made ditches that lead to larger cement-lined ditches. It was learned from natives that water remains in the ponds and in the Río Chiquito at all times of the year. Gilmore (1947:148-150, fig. 2) presented a brief but adequate general description of the valley.

The type locality of *T. ater* is a pond, having a surface area of approximately two and one-half acres, in the east-central part of the valley. The average depth of the pond was estimated to be six feet; holes two to three times as deep were observed in several places. Water in the pond is warm (approximately 80 degrees Fahrenheit) and clear, enabling one to see the bottom clearly in the deepest places. A narrow intermittent channel leads from the northern side of the pond toward the Río Chiquito, approximately four miles distant. Thick patches of submergent aquatic vegetation (chiefly stonewort, *Chara zelandica* var. *inconstans*) cover approximately half of the bottom; the remaining areas are bare, revealing a grayish sediment. Water lilies (*Nymphaea* sp.) grow in the shallower parts of the pond and thick stands of cattails (*Typha latifolia*) and spike-rushes (*Eleocharis rostellata*) grow in and near the water at the edges of the pond. The nearly flat area surrounding the pond is grassy or marshy for a distance of several hundred yards and then gives way gradually to xeric associations including cacti, yucca, and mesquite. The I. U. paratype was obtained in a similar but much smaller pond on the northern side of the basin.

Specimens of *T. ater* were captured, along with large numbers of *Pseudemys scripta*, in hoop-nets baited with canned sardines, rodent bodies, and fresh cichlid fish. Some turtles of both species entered the hoop-nets as soon as 30 minutes after fresh bait had been placed in the nets. Examples of *T. ater* seemed to be attracted by the small live fish that entered the nets as well as by the bait. The relative abundance of turtles in the pond, reckoned on the basis of trapping records, may be expressed as one individual of *Trionyx* per 4.2 individuals of *Pseudemys*.

The heads of several *T. ater* could usually be seen at dusk by scanning the surface of the pond with binoculars. No turtles were seen on the surface or beneath the water during daylight hours; it is assumed they sought cover beneath dense vegetation or in sediment at the bottom of the pond. Softshells entered hoop-nets at various times between dusk and dawn and continued to enter in the course of the day if the sky was overcast; success of trapping decreased sharply during periods of bright sunlight.

The stomach of one of the paratypes (KU 46908) contained 23 larvae of long-eared leaf beetles (Chrysomelidae: *Donacia* sp.) and many short pieces of roots of spike-rushes; the roots probably were ingested incidentally along with the larvae that were attached to them.

Remarks.—The second and third largest paratypes (KU 46906 and 46908) were dissected and found to have immature ovaries; probably, therefore, the holotype, a slightly larger specimen, is immature as well. Larger adults were probably unable to enter hoop-nets, the largest of which had openings slightly less than one foot wide.

Natives at Cuatro Ciénegas refer to softshell turtles as "*tortuga blanca*"; they make no distinction between *T. spinifer emoryi* and *T. ater*.

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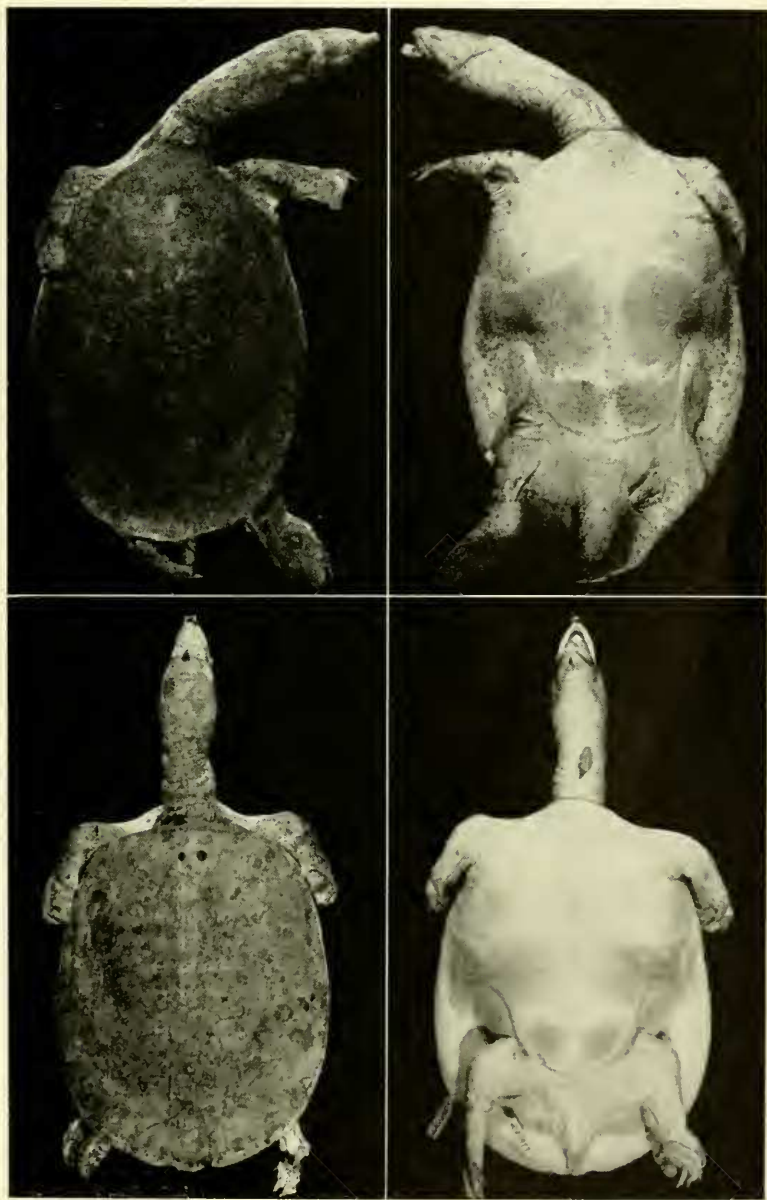
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Measurements (in millimeters) of type and paratypes of *Trionyx ater* new species. Length of snout was measured from middle of tip of snout to anterior corner of eye. All measurements are maximal.

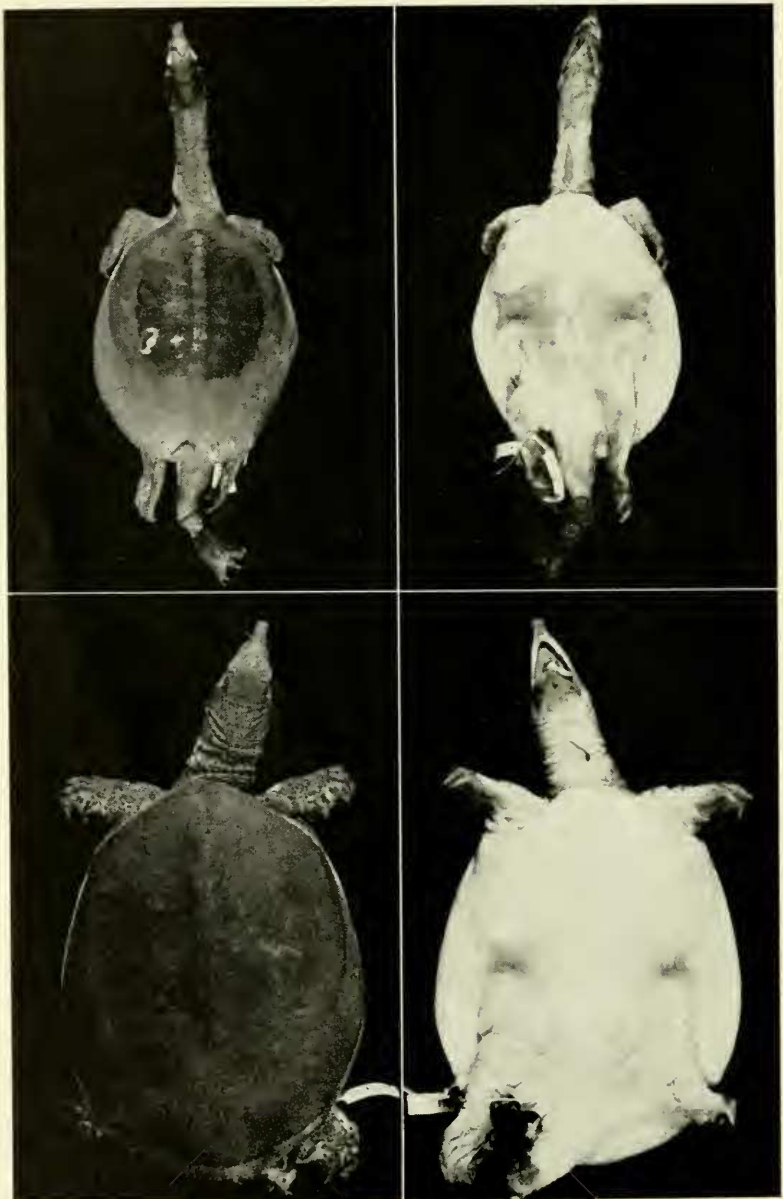
NUMBER	Sex	Length of carapace	Width of carapace	Length of plastron	Height	Width of head	Length of snout
KU 46903	♀	243	178	183	63	37	22
KU 46906	♀	231	181	172	66	37	22
KU 46908	♀	213	148	155	52	32	20
KU 46910	♀	211	152	158	53	29	18
IU 43510	♀	210	164	163	49	30	19
KU 46905	♀	205	156	151	51	32	20
KU 46912	♀	189	140	139	46	27	18
KU 46909	♀	186	142	136	47	28	18
KU 46904	♀	152	117	108	36	23	13
KU 46911	♂	134	108	95	41	22	14

PLATE I



Top. *Trionyx ater* sp. nov., dorsal and ventral views of holotype, KU 46903 ($\times \frac{1}{5}$). Bottom. *Trionyx spinifer emoryi*, dorsal and ventral views of female (KU 46913) from Río Chiquito, 10 km. S Cuatro Ciénegas, Coahuila, Mexico ($\times \frac{1}{4}$).

PLATE II



Top. *Trionyx ater* sp. nov., dorsal and ventral views of adult male, KU 46911 ($\times \frac{1}{2}$). Bottom. *Trionyx spinifer emoryi*, dorsal and ventral views of adult male (KU 46907) from type locality of *T. ater* ($\times \frac{1}{2}$).

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[No. 3

A New Caecilian Genus in India

BY

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The Caecilian fauna of Pakistan and India has long been known to comprise species of four recognized genera: *Ichthyophis* Fitzinger, *Uracotyphlus* Peters, *Gegeneophis* Peters, and *Herpele* Peters. A fifth genus is herein described. Some of the more obvious differences in the five genera may be expressed in the following key:

KEY TO ASIATIC CAECILIAN GENERA

1. Scales absent; one row of teeth in the lower jaw; tentacle cone-shaped, close behind and below nostril, nearer to tip of snout than to eye; squamosal and parietal bones in contact *Gegeneophis*
Scales present; one or two rows of teeth in the lower jaw 2
2. Eye hidden, covered by bone; tentacle conical, below and somewhat behind the nostril, closer to tip of snout than to eye, the tentacular opening circular; squamosal and parietal bones in contact *Herpele*
Eye not covered by bone, more or less visible; tentacle variable 3
3. Vent transverse; tentacular opening horseshoe-shaped, surrounded by a low craterlike elevation whose inner sides are marked with minute valleys and ridges (shape of extruded tentacle not known); tentacle situated directly in front of eye and on a level with nostril, but much closer to eye than to nostril, the tentacular groove on skull forming a forward extension of the orbit; (relation of skull bones to each other not known); no tail present, end of body rounded *Indotyphlus*
Vent longitudinal, a short pointed tail, bearing transverse folds 4
4. Tentacle flaplike, nearer to tip of snout than to eye, situated almost directly below nostril, near mouth; squamosal and parietal bones separated by a diastema; orbit not elongated forward; a prefrontal and postfrontal; no frontoparietal foramen; internal nares open between vomer and palatine; fewer than 200 folds, none angular *Uracotyphlus*
Scales present under skin throughout body; tentacle conical, near edge of mouth, much closer to eye than to nostril; parietal and squamosal bones in contact; more than 200 grooves (or folds); one or two rows of teeth on mandible; folds on venter largely angular *Ichthyophis**

* There is strong probability that when it is possible to study skulls of the various species now described, *Ichthyophis* will be found to consist of more than a single genus.